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TECHNICAL SPECIFICATIONS FOR THE HIGH SPEED SPECTRAL CONFOCAL MICROSCOPE WITH SUPER RESOLUTION.

Fully motorised inverted microscope based confocal microscope for high resolution, High Speed imaging applications with macro to microscopic imaging with 3D FRET, FRAP, Photo activation applications with the below specifications. System should be state of the Art facility which should be capable to perform wider applications which must include Multidimensional imaging including long term time lapse imaging, FRET, FRAP, co-localisation, 3-D and 3D De-convolution capabilities. The system should be based on advanced fully motorized inverted Fluorescence Microscope.

1. MICROSCOPE

A. FRAME: Fully motorised rugged microscope body with a built Z motor with minimum 10-15nm or lower step size. The motorised nosepiece should accommodate at least 6 objectives All the microscope conditions should be displayed on the microscope /joystick control with LED/TFT display. The system should have left side port for camera. System can be controlled with a remote LCD touch screen panel/through imaging software to avoid minor vibrations during acquisition. Control of all the motorised functions includes the XY motorised stage and Drift compensators be done through LCD Panel. The light path selection should be 100/0, 0/100 and 50/50 or 20/80 between Eye piece and camera port.

B. TRANSMITTED LIGHT: Fully motorised inverted fluorescence microscope with bright LED for DIC and BF applications.

C. EYEPIECES: A suitable binocular observation tube with two 10X eyepieces with a minimum 22 FN or better.

D. CONDENSER: A motorised 6-7 position long working distance condenser with dedicated slots for DIC prisms for 10X, 20X, 40X, 60X and 100X Objectives. 40X Phase for long working distance objective. System should have all the DIC components for 10-100x objectives. User should be able to shift between DIC and fluorescence/confocal imaging with single click in the software.

E. MOTORIZED STAGE: High precision Motorized X-Y Stage with controller and joystick having holders to accommodate glass slides, plates& 35mm petri dishes.

F. OBJECTIVES: Confocal Grade Plan Apochromatic objectives with 1.25X or/2.5X/2X, 10X / 0.40 or better, 20X / 0.8 or better, 40X / 0.95 or better, 60X / 1.42 or better and 100X / 1.45 or better. One additional 40X phase long working distance objective of plan fluor category. Objectives with 10X to 100X magnifications should have DIC components. One extra-long range objective 40X should be provided for thick samples. Imaging oil should be provided (2 nos at least).

G. FLUORESCENCE: A bright white LED/LED light source with different wavelengths for fluorescence imaging with touch pad/control pad to control the intensity. The light source should support for DAPI, FITC TRIC and far red observation. The mortised fluorescence filter cube turret should have slots to accommodate DAPI, GFP, TRITC, RFP/DsRed, Cy3 and mCherry filters at a time.

H. CONFOCAL: Laser point scanning and Confocal detection unit with minimum 2-4channels for simultaneous detection of 2-4fluorophores and should be upgradable with additional detectors in future. The system currently should allow for two colour detection simultaneously. A dedicated high resolution high speed confocal microscope with the following specs should be quoted.

I. LASERS AND COMBINER: All the laser should be stable diode/solid state laser controlled by AOTF for precise switching and swift selection of the desired laser lines. The laser lines should be 405nm, 488nm 514nm or561nmand 640nm.All lasers should have minimum lifetime of more than 10,000 Hours each

J. **GALVO AND HIGH SPEED RESONANT SCANNER** XY galvo scanner with imaging FOV of >18 mm or better (bigger imaging FOV will be preferred), with scanning resolution of 4-8 k x 4-8 k or better with a scanning speed of up to 10fps @512x512 resolutions or better. System should also have a dedicated resonant /dedicated high speed scanner for high-speed imaging with frame rates of 28-30 or better fps @512x512 or better resolution (at 1X zoom without compromising the imaging FOV of at least > 18 mm or above, higher imaging FOV will be preferred) and 400 fps or better @512x16 or better resolution, higher imaging speed will be preferred. Scanning zoom of 1-40 times or better with ROI Scan should be achieved. The scanner should have ability to scan in various scan areas modes such as rectangle, clip, polygon, free area, line, circular and multi-dimensional scanning modes of PT(point), XT, XZ, XY, XZT, XYλ , XYT, XYZ, XYZT, XYλT, XYλZ, XYλZT, along with 3D reconstruction.

The galvanometer scanner and high speed scanner should easily be easily be switchable in real time for fast FRAP/Photoactivation experiments. All the lasers should be available for Photomanipulations and photoactivations experiments and should easily be able to switch between imaging and bleaching scanners.

2 DETECTORS:

The detector should be built inside/separate of the scan head directly connected to microscope to enhance the sensitivity. The system should have 2-4detectors out of which at least two detectors should be filter free spectral detectors with independent Gain offset and voltage modules. Both these detectors should be High Sensitivity Detectors / Hybrid Detectors having QE of at least 45% or higher. All the detectors should be able to perform spectral unmixing simultaneously. The spectral resolution should at least be > 2-3 nm throughout the spectral range. At least some detectorsshould have the capability of parallel lambda scan mode. The spectral type and should be built inside/separate of the scan head for better sensitivity and to prevent loss of signal. A dedicated transmitted light detector should be provided for DIC imaging. All the detectors should have a spectral detection rage from 400-750 nm.

A. SOFTWARES

1) Basic image acquisition and processing, complete microscope control, Scan head control and Laser control software, all of these should be taken care through the software.
2) Saving of all instrument parameters along with the image for repeatable/reproducible imaging.
3) Z-Stack, Frame/line/lambda capturing, Time series imaging capabilities.

4) The triggering device of Lasers for microfluidics applications should also be controlled by the confocal imaging software.
5) FRAP, FRET Imaging, Calcium imaging, deep tissue imaging should be included.
6) Co-localization analysis and volume rendering, voxel imaging (IMARIS).
7) Real time ratio-display and Real time spectral Unmixing.
8) 2D and 3D image deconvolution.
9) Diverse measurement and statistical processing.
10) Software should be capable to record Live graphs of different Live cell imaging experiments parameters as a recorded data.
11) The software should have acquisition & analysis function such as intensity measurement (online & offline) over time, over depth and over lambda, colocalization 3D rendering of time lapse imaging, Measurements, 2D & 3D deconvolution, Dynamic ROI, EFI/EDF, Background subtraction/correction, bleaching correction, etc.

B. CO2 Incubation System with heating stage for live cell imaging.

C. ANTI VIBRATION TABLE: A suitable anti vibration table with active air compressor control with M6 holes to fix the microscope and confocal microscope should be part of standard supply.

3. COMPUTER WORKSTATION:
System must be controlled with computer control unit having the latest 64 bit control computer with Intel Xeon Processor, DDR RAM 16 GB or better, HDD: 2TB SATA upgradable to 4 TB or better, DVD, Super Multi SATA +R/RW, Graphics : AT Fire GL V5200 256MB DH DVI, Gigabit Ethernet, Win 10 Ultimate, USB 2.0, Fire wire. 2 x Large 30 inch or bigger LED monitor for better visualization.

Suitable 5KVA Online UPS with backup of minimum 30 minutes should be supplied with the system.

Detailed list of users of the quoted system in India with contact details to be provided by bidder. The specifications in compliance table should be supported by original brochure/literature.

ADDITIONAL TERMS AND CONDITIONS.:

1. Warranty: Instrument should be supplied with 3 years warranty for all parts/consumables after successful installation and training.

2. Installation: Bidder should install the equipment at Institute within 30 days from the date of delivery.

3. Training: Bidder should provide onsite comprehensive training to lab staffs and students at the time of installation and as on whenever required till the product is under warranty. A dedicated person should spend at least 1 month for training.

4. Spare parts: Bidder should ensure the availability of spare parts for at least 10 years.

5. After sale services: Bidder should have authorized agent in India to provide hassle free after sale service.

6. Documentation: Bidder should submit schematic diagram, product catalogue, previous order copies from government/autonomous educational/research institute/University along with tender document.

7. Onsite Training from factory trained Application Specialists for a period of 2-4 weeks. Principal company direct service & application support should be available in India in addition to the support staff from the local Indian Vendor.